Amendments to the Claims

The listing of claims presented below replaces all prior versions, and listings, of claims in the application.

Listing of claims:

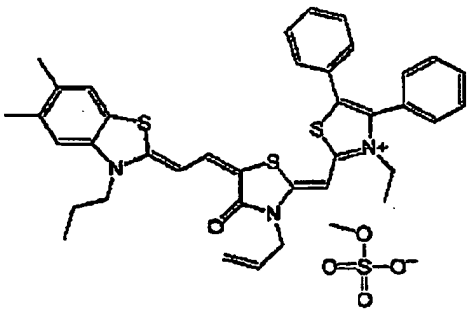
1 - 39. (cancelled)

40. (new) A method of producing a volume hologram, wherein a hologram recording portion comprising a photosensitive composition for volume hologram recording comprising a photopolymerizable compound as a refractive index modulation component, a photopolymerization initiator and a sensitizing dye which increases the sensitivity of the photopolymerization initiator with respect to a wavelength in the visible region is subject to interference exposure using a predetermined volume hologram recording wavelength set in a visible region to record a volume hologram,

wherein the predetermined volume hologram recording wavelength is set within the region of 630 nm to 670 nm; and

wherein the sensitizing dye absorbs at the predetermined volume hologram recording wavelength, has a maximum absorption wavelength deviating by 14 nm or more from the predetermined volume hologram recording wavelength, and is selected from the group consisting of the following compounds (1) and (2):

Compound (1):



(chemical name: 2-[[3-allyl-5-[2-(5,6-dimethyl-3-propyl-2(3H)-benzothiazolylidene)ethylidene] –4-oxo-2-thiazolidinylidene]methyl]-3-ethyl-4,5-diphenylthiazolium methylsulfate);

Compound (2):

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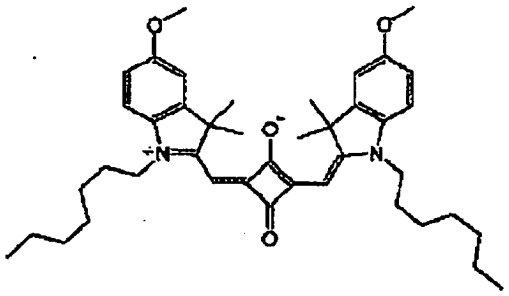
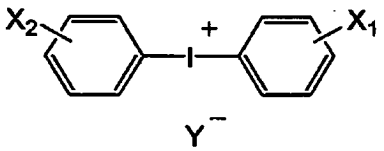


(chemical name: 1-heptyl- 2-[3-(1-heptyl-5-methoxy-3,3-dimethyl-1,3-dihydro-indole-2-ilidenemethyl)–2-hydroxy-4-oxo-2-cyclobutenylidenemethy]-5-methoxy-3,3-dimethyl-3H-indolium inner salt.

41. (new) A method of producing a volume hologram according to Claim 40, wherein the photopolymerization initiator is a compound containing diaryliodonium skeleton represented by the following general formula (2):
General formula (2):



wherein, each of "X_1" and "X_2" is independently an alkyl group having 1 to 20 carbons, halogen or an alkoxyl group having 1 to 20 carbons; and "Y^-" is a monovalent anion.

42. (new) A method of producing a volume hologram according to Claim 40, wherein the photosensitive composition for volume hologram recording further contains a binder resin and/or a thermosetting compound.

43. (new) A method of producing a volume hologram according to Claim 40, wherein the photopolymerizable compound is at least one kind selected from the group consisting of a photoradical polymerizable compound and a photocationic polymerizable compound.

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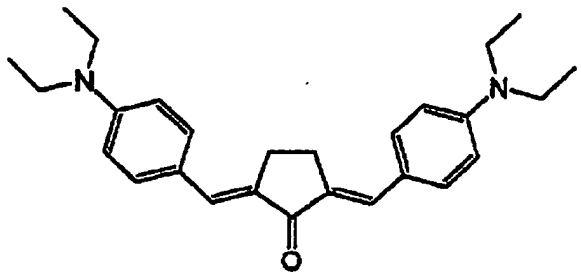
44. (new) A method of producing a volume hologram according to Claim 40, wherein the photosensitive composition for volume hologram recording further contains a second refractive index modulation component having different refractive index from that of the photopolymerizable compound.

45. (new) A method of producing a volume hologram according to Claim 40, wherein a volume hologram having a diffraction efficiency of 80% or more is obtained.

46. (new) A method of producing a volume hologram, wherein a hologram recording portion comprising a photosensitive composition for volume hologram recording comprising a photopolymerizable compound as a refractive index modulation component, a second refractive index modulation component having a different refractive index from that of the photopolymerizable compound, a photopolymerization initiator and a sensitizing dye which increases the sensitivity of the photopolymerization initiator with respect to a wavelength in the visible region is subject to interference exposure using a predetermined volume hologram recording wavelength set in the visible region to record a volume hologram,

wherein the predetermined volume hologram recording wavelength is set within the region of 514 nm to 560 nm; and

wherein the sensitizing dye absorbs at the predetermined volume hologram recording wavelength, has a maximum absorption wavelength deviating by 14 nm or more from the predetermined volume hologram recording wavelength, and is selected from the group consisting of the following compounds (3) and (4):
Compound (3):



(chemical name: 2,5-bis(4-diethylaminobenzylidene)cyclopentanone);

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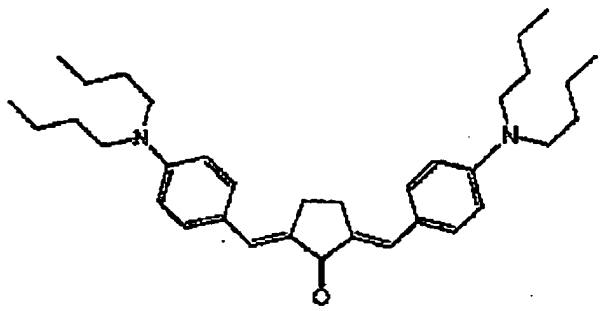
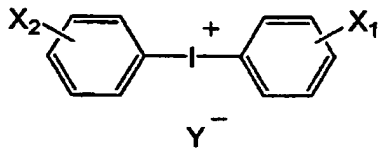
Compound (4):



(chemical name: 2,5-bis(4-dibutylaminobenzylidene)cyclopentanone).

47. (new) A method of producing a volume hologram according to Claim 46, wherein the photopolymerization initiator is a compound containing diaryliodonium skeleton represented by the following general formula (2):
General formula (2):



wherein, each of "X_1" and "X_2" is independently an alkyl group having 1 to 20 carbons, halogen or an alkoxyl group having 1 to 20 carbons; and "Y^-" is a monovalent anion.

48. (new) A method of producing a volume hologram according to Claim 46, wherein the photosensitive composition for volume hologram recording further contains a binder resin and/or a thermosetting compound.

49. (new) A method of producing a volume hologram according to Claim 46, wherein the photopolymerizable compound is at least one kind selected from the group consisting of a photoradical polymerizable compound and a photocationic polymerizable compound.

50. (new) A method of producing a volume hologram according to Claim 46, wherein a volume hologram having a diffraction efficiency of 80% or more is obtained.

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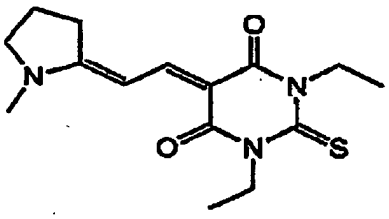
51. (new) A method of producing a volume hologram, wherein a hologram recording portion comprising a photosensitive composition for volume hologram recording comprising a photopolymerizable compound as a refractive index modulation component, a photopolymerization initiator and a sensitizing dye which increases the sensitivity of the photopolymerization initiator with respect to a wavelength in the visible region is subject to interference exposure using a predetermined volume hologram recording wavelength set in the visible region to record a volume hologram,

wherein the predetermined volume hologram recording wavelength is set within the region of 420 nm to 488 nm; and

wherein the sensitizing dye absorbs at the predetermined volume hologram recording wavelength, has a maximum absorption wavelength deviating by 14 nm or more from the predetermined volume hologram recording wavelength, and is selected from the group consisting of the following compounds (5) and (6):

Compound (5):



(chemical name: 1,3-diethyl-5-[2-(1-methyl-pyrrolidine-2-ilidene)-ethylidene]-2-thioxo-dihydro-pyrimidine-4,6-dione);

Compound (6):

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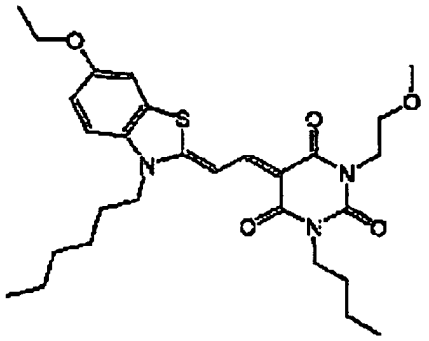
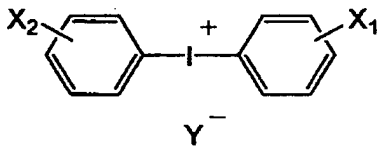


(chemical name: 1-butyl-5-[2-(6-ethoxy-3-hexyl-3H-benzothiazole-2-ilidene)-ethylidene]–3-(2-methoxy-ethyl)–pryimidine-2, 4, 6-trione.

52. (new) A method of producing a volume hologram according to Claim 51, wherein the photopolymerization initiator is a compound containing diaryliodonium skeleton represented by the following general formula (2):
General formula (2):



wherein, each of "X_1" and "X_2" is independently an alkyl group having 1 to 20 carbons, halogen or an alkoxyl group having 1 to 20 carbons; and "Y^-" is a monovalent anion.

53. (new) A method of producing a volume hologram according to Claim 51, wherein the photosensitive composition for volume hologram recording further contains a binder resin and/or a thermosetting compound.

54. (new) A method of producing a volume hologram according to Claim 51, wherein the photopolymerizable compound is at least one kind selected from the group consisting of a photoradical polymerizable compound and a photocationic polymerizable compound.

55. (new) A method of producing a volume hologram according to Claim 51, wherein

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the photosensitive composition for volume hologram recording further contains a second refractive index modulation component having a different refractive index from that of the photopolymerizable compound.

56. (new) A method of producing a volume hologram according to Claim 51, wherein a volume hologram having a diffraction efficiency of 80% or more is obtained.

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